MATH 277 **FALL 2013**

GEOMETRY FOR ELEMENTARY EDUCATION MAJORS

TR 3:30–4:45 **EMS E408**

INSTRUCTOR: Fredric Ancel
OFFICE: EMS E473 PHONE: 229-6372 EMAIL: ancel@uwm.edu
OFFICE HOURS: TR 2:30 – 3:25, and by appointment

PREREQUISITES: You must have passed MATH 176 with a grade of C or better, or have the consent of the instructor.

COURSE TEXT: available at bookstore and at https://pantherfile.uwm.edu/ancel/www/

COURSE OBJECTIVE: Geometry is a vast subject with a several thousand year history and mention of geometric methods can be found in some of the earliest written human records. Geometry is, on the one hand, a very applicable subject comprising a collection of methods for studying properties of figures in space. These properties include length, angle, area, volume, visual patterns and symmetry. On the other hand, geometry is a highly interconnected logical subject in which a few simple basic principles give rise to huge variety of geometric facts and techniques. The goal of this course is to develop the students' familiarity and facility with both of these aspects of geometry. Students will be exposed to the basic facts and techniques of geometry by having them solve practical and tangible problems involving spatial objects and patterns. Also students will confront the logical web of geometry based on simple axioms by having them formulate conjectures, complete proofs and search for counterexamples.

The course covers four topics:

I. Geometry as a measuring tool: accuracy, the Pythagorean Theorem, similar triangles, large-scale measurements

II. Rigid Motions and Symmetry

III. Geometry as a logical system: axioms, definitions, proofs and counterexamples

IV. Geometry of the sphere: the Earth and the Sun

COURSE FORMAT: A typical class will involve a series of activities. Each activity will pose a problem that will be investigated either through a discussion that involves the entire class or by breaking the class into small groups that will each explore the problem and report their results to the entire class. Investigations that begin with in-class activities are extended in homework problems. Homework is an important part of the course activities, and students are expected to try all the homework problems. Solutions to homework problems will be provided. Selected homework problems will be graded.

GRADES AND EXAMS: Grades will be based on three in-class exams, a final exam, written homework and attendance Each in-class exam is worth 100 points, the final exam is worth 150 points, and homework and attendance are each worth 50 points. In determining your final grade, your lowest in-class exam score will be replaced by $^{2}/_{3}$ of your final exam score if it is to your advantage. The tentative exam dates are:

EXAM 1: Tuesday, September 24

EXAM 2: Tuesday, October 22

EXAM 3: Thursday, November 14

FINAL EXAM: Friday, December 20, 12:30 – 2:30

MAKE-UP EXAMS. Normally make-up exams will not be given. A missed in-class exam will be regarded as your lowest exam score and will be replaced by $^{2}/_{3}$ of your final exam score. (An exception to this policy will be granted only in the case of a DIRE medical situation and only if the student informs the lecturer about the medical situation BEFORE the exam and provides DOCUMENTATION of the medical situation.)

UNIVERSITY POLICIES: Links to UWM policy statements for faculty and students can be found on-line at:

http://www4.uwm.edu/secu/SyllabusLinks.pdf

These statements cover a variety of topics including students with disabilities, religious observance, discriminatory conduct such as sexual harassment, academic misconduct, and complaint and grade appeal procedures.

SUPPLIES:
pencils
foot ruler with metric units on it
compass
protractor (large is better than small)
plastic right-angled triangle
scissors
clipboard
scientific calculator (with a memory)

Optional: T-square